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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,399	11/14/2003	Kevin M. Moore	1533.3500003	6849

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STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.  
1100 NEW YORK AVENUE, N.W.  
WASHINGTON, DC 20005

EXAMINER
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OH, TAYLOR V

ART UNIT	PAPER NUMBER
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1625

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/07/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/712,399	<b>Applicant(s)</b> MOORE ET AL.	
	<b>Examiner</b> Taylor Victor Oh	<b>Art Unit</b> 1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 07 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-10,13-61,63,65 and 66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-10,13-61,63,65 and 66 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **Final Rejection**

### **The Status of Claims**

Claims 1-2, 4-10, 13-61, 63, and 65-66 are pending.

Claims 1-2, 4-10, 13-61, 63, and 65-66 are rejected.

### **Claim Rejections-35 USC 112**

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The rejection of Claims 1-2,13-61 under 35 U.S.C. 112, first paragraph, has been withdrawn due to the modification made in the amendment.

### **Claim Rejections-35 USC 103**

1. Applicants' argument filed 12/07/2006 have been fully considered but they are not persuasive.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 1625

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Rejection of Claims 1-2, 4-10, 13-61, 63, and 65-66 under 35 U.S.C. 103(a) as being unpatentable over Hartmann (U.S. 3,454,603) in view of Feldmann et al (U.S. 4,564,692) and Brinegar et al (WO 00/14081).**

The rejection of claims 1-2, 4-10, 13-61, 63, and 65-66 under 35 U.S.C. 103(a) as being unpatentable over Hartmann (U.S. 3,454,603) in view of Feldmann et al (U.S. 4,564,692) and Brinegar et al (WO 00/14081) is maintained with the reasons of the record filed on 09/07/2006.

**Applicants' Argument**

2. The applicants argue the following issues:

A . Hartmann teaches away from Feldmann since Hartmann described that the crystallization of 1,4-3,6-dianhydro-d,L-glucitol (sorbitol) is not readily done ; therefore, crystallization is not used as a method to purify 1,4-3,6-dianhydro-d,L-glucitol (sorbitol) ; thus, there is no prima facie case of obviousness for combining them ;

B . None of the prior art teach that the initial dehydration should be performed without a solvent; the absence of solvent is not suggested in any of the cited publication: Hartmann teaches the use of soluble acid catalysts and the use of those catalysts necessitates addition of the solvent water to the initial reaction mixture; Feldman , while not enabled for production of anhydrosugar alcohols,

also notes that sugar alcohol dehydration occurs in the presence of a solvent as well as the Brinegar et al teaches the same things in the process.

The applicants' argument have been noted, but these arguments are not persuasive.

First, with regard to the first argument, the Examiner has noted applicants' argument. However, the phrase "it is not readily crystallized" means that the crystallization of 1,4-3,6-dianhydro-D,L-glucitol (sorbitol) does not take place easily; this does not imply that its crystallization would not work at all; in other words, it may work, but it may take some time before it happens. This scenario can be clearly seen from the examples 1-5 (see col. 5 to col. 6, line 9) of the Feldmann et al in which all the examples have used a seeding technique for crystallizing the 1,4-3,6-dianhydro-glucitol (sorbitol) in order to facilitate the crystallization process. From this, they are related to each other; there is a motivation to combine the prior art. Therefore, it would have been obvious to the skilled artisan in the art to be motivated to incorporate the Feldmann's et al seeding crystallization technique into Hartmann in order to further purify the desired product suitable for producing polyesters. This is because the skilled artisan in the art would expect to improve on the purity of the desired compound by applying the Feldmann et al crystallization technique to the Hartmann process.

Second, regarding the second argument, the Examiner has noted applicants' argument. However, regardless of using the solvent in the initial dehydration process, the Brinegar et al has been used as the tertiary reference to supplement the primary

Art Unit: 1625

reference regarding the teaching of AG50W-X12 acidic catalyst useful for producing anhydro sugar alcohols with no residue.

For the Hartmann process, unlike applicants' argument, there is no addition of any solvent in the initial dehydration process; this can be easily explained in view of the following example 1 (see col. 3, lines 10-25):

**A 20 gram sample of D,L-talitol containing some D,L-sorbitol as obtained from the catalytic isomerization of dulcitol and separated as described by Wright and Hartmann (Journal Organic Chemistry 26, 1588, 1961) was charged to a semimicro flask equipped with a thermometer and capillary which was attached to a condenser via a simple stillhead and the sample heated to 100° C. at which temperature it melted. A receiver and Dry Ice trap were attached. Then, 0.2 gram of p-toluenesulfonic acid was added and vacuum applied. The charge was gradually heated to about 140° C. at 150 mm. Hg pressure under which conditions the evolution of water became measurable. The reaction was continued for two hours at 140° C. to 150° C. while the pressure was gradually reduced to about 35 mm. Hg. The charge was then neutralized**

From this example, what is observed is that, during the dehydration process, the formation of water has naturally occurred as a result of direct heating the sugar. This is apparently happened not by adding any solvent.

In addition, the secondary Feldmann et al expressly teaches the process of purifying the anhydro sugar alcohols obtained from acid-catalyzed dehydration of hexitols in the absence of organic crystallization solvents.

Hartmann does disclose the process of preparing 1,4-3,6-dianhydroglucitol by heating hexitols in the presence of sulfuric acid at a temperature of from 110 to 185° C., and then distilling the reaction mixture to recover dianhydrohexitols at low pressures, furthermore, the products may be purified by recrystallization. Also, Feldmann et al

Art Unit: 1625

expressly teaches the process of purifying the anhydro sugar alcohols obtained from acid-catalyzed dehydration of hexitols by crystallization from a concentrated solution in the absence of organic crystallization solvents; moreover, when sugar alcohols are dehydrated, the reaction mixtures contain various impurities detrimental to the production of polyesters (see col. 1, lines 23-30). Furthermore, Brinegar et al has offered guidance that AG50W-X12 acidic catalyst can be used with an advantage of little or no residue in producing anhydro sugar alcohols (see page 7, lines 5-6) as a substitute.

Therefore, it would have been obvious to the skilled artisan in the art to be motivated to incorporate the Feldmann et al crystallization technique into Hartmann along with Brinegar's et al AG50W-X12 acidic resin catalyst in order to further purify the desired product suitable for producing polyesters. This is because the skilled artisan in the art would expect such a combination to be feasible and to improve on the purity of the desired compound by applying the Feldmann et al crystallization technique to the Hartmann process as shown in the Brinegar et al prior art.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1625

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas McKenzie can be reached on 571-272-0670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 1625

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Taylor Victor Oh, MSD,LAC  
Primary Examiner  
Art Unit : 1625

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3/2/07